

EPA Question #7: Pre-Site Characterization

Clarification of Pre-site Characterization Conducted Prior to Sampling

Shell Exploration & Production Company – Alaska Venture (Shell) developed the following response to address EPA’s Question #7 on pre-site characterization of proposed borehole locations. What is provided herein is believed to be a good representation of the process outlined at the current time. However, there may in the future need to be some alteration to the process owing to information/experiences obtained in the field, regulatory requirement and/or Shell’s future developmental plans.

Introduction

EPA’s draft NPDES general permit for oil and gas geotechnical surveys (GGP) in the Alaska Arctic Beaufort and Chukchi Seas (AKG-28-4300) contains a requirement for operators conducting surveys in the Outer Continental Shelf (OCS) to clear geotechnical borehole sites as part of a Phase I environmental monitoring program (EMP) study prior to mobilizing to the site for field activities. The EPA’s impetus behind these requirements appears to be to protect any potentially important or historically significant archaeological sites, sites of historical significance, and/or potentially fragile benthic communities. Archeological sites clearance is admittedly important for safe and successful operation of geotechnical borehole activities, especially if there is the potential for existence of hazardous objects or artifacts in the seabed.

It is important to note that as a general rule, something equivalent to this task is normally performed as part of pre-planning for most any reputable geotechnical investigation undertaken in any region of the world. Due to past incidents where seabed founded geotechnical gear was lost or heavily damaged by previously unidentified seafloor hazards (relict subsea wellheads, pipelines, etc) offshore geotechnical field services contractors are required via their insurers to review existing geophysical data and obtain a site clearance prior to their mobilization. In addition, the Bureau of Ocean Energy Management (BOEM) has Notice to Lessee (NTL) requirements for pre-site investigation clearance of potentially fragile benthic settings and potential for archaeological significance via the acquisition of site-specific geophysical data and analysis by registered professional geologists and archeologists. The following discussion presents a recommended approach to satisfying the requirement of pre-site investigation clearance in the context of NPDES which assures compliance without generating any additional on-site field survey work of the EMP which could increase the environmental impacts. It is recommended that EPA revise the draft NPDES general permit for geotechnical surveys requirement to state that these processes and data, ultimately supplied to the agency, can be used in lieu of making it a requirement to “re-collect” the data during the EMP prior to conducting a geotechnical borehole.

Geotechnical Pre-Site Clearance via Shallow Hazard Surveys Data

BOEM’s Alaska NTL requirement NTL No. 05-A01 necessitates pre-site investigation clearance be conducted on leased OCS lands in advance of a site investigation that disturbs the seabed. Shell adheres to the requirement to perform pre-site investigation via shallow hazard surveys. The outcomes of shallow hazard surveys summarize the likelihood of, and/or identify indications of potentially sensitive sites, archaeological features, or potential hazards (anomalies). Available field acquired data during shallow hazard surveys includes Subbottom Profiler (SBF) data, variable frequency FM CHIRP Profiler (CHIRP) data, Side Scan Sonar (SSS) data,

Precision Single Beam Echo Sounder (SBES) data, Multi Beam Echo Sounder (MBES) data, Backscatter (BS) data, and 2D Hi-Res (2DHR) digital data. Raw field trackline data gathered by the above are reviewed shot-point by shot-point for indications of sensitive benthic communities, archaeological features, and shallow hazards. Specific geotechnical borehole locations are typically specified on an "as-acquired" trackline (and accompanying tie line if available) to ensure the location does not encroach on any known anomalies or potential sensitive sites of interest (e.g., sensitive benthic community or potential archaeological feature). This process is repeated for each potential borehole location within a specific shallow hazard survey area.

Geotechnical Pre-Site Clearance via Ice Gouge Survey Data

Shell also performs similar in-house analyses of our previously acquired ice gouge survey data when planning potential geotechnical survey boreholes on or off of an OCS lease. The primary difference in analysis between the above shallow hazard survey data and the acquired ice gouge data is that 2D Hi-Res data is not acquired along ice gouge tracklines. The 2D Hi-Res data are applicable to subsurface drilling hazards such as shallow gas and faulting, which may exist below the typical depths of geotechnical surveys. The other field data, CHIRP, SSS, SBES, MBES and BS are gathered along tracklines for ice gouge surveys. Shell is conducting analyses of existing geophysical survey data for the potential presence of sensitive benthic sites, archaeological features, or other sites of potential historical significance. MBES, SSS, and SBF data acquired for ice gouge surveys in the Chukchi Sea in 2013 are being used to clear proposed geotechnical boreholes along tracklines for the next open-water season. These analyses and reports allow Shell to track and verify clearance analyses of proposed geotechnical borehole locations.

Final Geotechnical Pre-Site Clearance Activities

A final check in the field prior to initiating drilling and sampling activities is conducted once a vessel is on site of a proposed geotechnical borehole. Geotechnical contractors typically have the ability to deploy scanning sonar (e.g., Mesotech) to just above the seabed either through the drill pipe on a wireline, or over the side of the vessel on a crane or davit. Scanning sonar produces data in the form of an electronic color rendering of the seabed. This technology has been utilized throughout the years around the world as a final, pre-site evaluation to clear potential borehole locations of hazards such as relict wellheads, pipelines, jack up rig spud can depressions, and any other potential bottom-founded obstructions. Given the limited amount of prior activities in the Beaufort or Chukchi Seas, these types of features are not anticipated. Regardless, Shell proposes this type of scanning sonar activity be performed prior to drilling and sampling at proposed geotechnical borehole locations. This proposed approach provides for complete pre-screening of proposed geotechnical borehole locations while maintaining a limited, potential impact to stakeholders and environmental footprint.